

THEODORE TOMARAS' PHYSICS LECTURESHIP

The [Physics Department of the University of Crete](#), starting from 2025, has instituted the yearly “Theodore Tomaras’ Physics Lectureship” in memory of the former Department Professor Theodore Tomaras who has passed away recently.

Prof. Tomaras had established the Physics Department Colloquium thirty-five years ago. Since then, the colloquium is repeated weekly until today.

Prof. Tomaras received his PhD from Harvard University in 1980. During 1980-1983 he was postdoctoral researcher at the group of M. Gell-Mann at the California Institute of Technology (Caltech). From 1983-1985 he served as assistant professor at Rockefeller University in New York. He left Rockefeller in order to do his military service (1986-1987) and to become associate professor at the University of Crete. During the period 1987-1989 he served as visiting professor at Ecole Normale Supérieure in Paris.

He served as associate professor at the University of Crete from 1989-1995. He became full professor of the Physics Department in 1995. He served in several administrative positions at the University of Crete, and was chairman of the Physics Department during the period 1995-1999. He retired in 2020. He was elected emeritus professor the same year. He passed away in August 2021.

His research interests included the phenomenology of particle physics, the study of solitons in high energy physics and condensed matter physics, the beyond the Standard Model physics, the phenomenology of string theory, classical and quantum gravity, as well as cosmological inflation and the cosmology of de Sitter space.

The contribution of Prof. Tomaras to the evolution of the Physics Department and the University of Crete has been important via his work in key committees of the Department and the University.

The annual “Theodore Tomaras Physics Colloquium” that was instituted recently, serves to recognize his contributions to the Physics Department.

This colloquium will be delivered by world class scientists from research fields that rime with T. Tomaras’ research. The “Theodore Tomaras Physics Colloquium” will be organized by the [Crete Center for Theoretical Physics \(CCTP\)](#).

*This year's "Theodore Tomaras Physics Lectureship" was awarded to **Daniel Louis Jafferis** from Harvard University*

for his seminal contributions in the field of Quantum Gravity.

Prof. Jafferis will give his Lecture on October 22, Thursday, at 17:15 at the N. Petridis auditorium of the Mathematics Department of the University of Crete.

The title of his lecture is:

"Traversable wormholes in quantum gravity"

Abstract: I will show that traversable wormholes can consistently exist in theories of quantum gravity. From the perspective of external observers, travel through the wormhole is a form of quantum teleportation. I will further discuss other surprising aspects of the nature of quantum information in dynamical spacetimes, and how emergent gravitational descriptions can give new insight into quantum phenomena.

SHORT CURRICULUM VITAE OF PROF. D. JAFFERIS

Daniel Louis Jafferis was born in 1983, in West Haven, Connecticut. He is an American theoretical physicist, known for his research on quantum gravity, supersymmetric quantum field theory, and string theory.

He entered Yale University in 1997, at the age 14, and graduated with a bachelor's degree in mathematics and physics in 2001. He received his PhD in physics from Harvard University in 2007. His PhD thesis "Topological string theory from D-brane bound states" was supervised by Prof. Cumrun Vafa.

Jafferis was from 2007 to 2010 a post-doctoral fellow at Rutgers University and from June 2010 to March 2011 a member of the Institute for Advanced Study in Princeton. He then became assistant professor at Harvard University and today he is a tenured professor of physics at the same University.

In 2008, Jafferis was, with Ofer Aharony, Oren Bergman, and Juan Maldacena, one of the developers of ABJM superconformal field theory a superconformal (N=6) Chern-Simons theory in three dimensions. This is dual to M-theory in $AdS_4 \times S^7$, described by M2-branes, the solutions of eleven-dimensional supergravity having three-dimensional world-volume – in AdS_4 (four-dimensional anti-DeSitter space). This theory is central for the celebrated AdS/CFT correspondence.

In 2012, with Silviu Pufu, Benjamin Safdi, and Igor Klebanov, he formulated a conjecture (conjectural F-theorem) about the behaviour of the free energy F in renormalization group flows of a three-dimensional supersymmetric quantum field theory.

In 2016, with Ping Gao and Aron C. Wall, Jafferis proposed a mechanism for traversable wormholes without exotic matter, motivated by holography. This mechanism turns out to be mathematically equivalent to the protocol known as quantum teleportation in Quantum Information Theory.

In 2012 Jafferis received the Henry Primakoff Award of the American Physical Society for "construction and study of three-dimensional supersymmetric quantum field theories."

In 2019 he was awarded the New Horizons in Physics Prize for "fundamental insights about quantum information, quantum field theory, and gravity."